

We claim:

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AS  
1. A method of enabling a selection of a program for viewing in a television system in which title information and characteristics of programs are made available as EPG (Electronic Program Guide) data including at least one program guide list, the method comprising the steps of:

recording a plurality of characteristics associated with each program viewed by said user in the television system;

forming sets of said characteristics, each said set comprising at least two of said  
10 characteristics; and

associating at least each set with an ordered value representative of user's desire to view a particular program;

wherein upon entry of a user request for a program recommendation, performing a search of the EPG data for programs with characteristics that best match said sets and  
15 notifying said user of an availability of programs that best match said sets as program recommendations.

2. A method according to claim 1, wherein  
said search is performed for programs that best match said sets and the user's  
20 information determined in accordance with user's manual operations.

3. A method according to claim 2, wherein  
said user's information is including a mood being experienced by said user.

25 4. A method according to claim 1, wherein  
said program recommendations are based on the programs that best match said sets comprising a greatest number of said characteristics.

30 5. A method according to claim 1, wherein  
said program recommendations are based on the programs that best match said sets associated with a lowest value as the ordered value.

6. A method according to claim 1, wherein

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said program recommendations are based on the programs that best match said sets associated with a highest value as the ordered value and comprising the greatest number of said characteristics.

5 7. A method according to claim 1, wherein

said program recommendations are based on the programs that best match said sets associated with a lowest value as the ordered value and comprising the greatest number of said characteristics.

10 8. A method according to claim 1, wherein

said sets of said characteristics is formed in response to that at least two of programs viewed by said user have the same characteristics.

15 9. A recommendation system for enabling a selection of a program for viewing in a television system in which title information and characteristics of programs are made available as EPG (Electronic Program Guide) data including at least one program guide list, the recommendation system comprising:

memory means for recording a plurality of characteristics associated with each program viewed by said user in the television system;

20 processing means for forming sets of said characteristics, each said set comprising at least two of said characteristics and for associating each said set with an ordered value representative of said user's desire to view a particular program;

searching means for performing a search of the EPG data for programs with characteristics that best match said sets; and

25 on-screen display means for notifying said user of an availability of programs that best match said sets as program recommendations upon entry of a user request for program recommendations.

30 10. A recommendation system according to claim 9, wherein

said search is performed for programs that best match said sets and the user's information determined in accordance with user's manual operations.

11. A recommendation system according to claim 10, wherein

said user's information is including a mood being experienced by said user.

12. A recommendation system according to claim 9, wherein  
said program recommendations are based on the programs that best match said  
sets comprising a greatest number of said characteristics.

13. A recommendation system according to claim 9, wherein  
said program recommendations are based on the programs that best match said  
sets associated with a lowest value as the ordered value.

14. A recommendation system according to claim 9, wherein  
said program recommendations are based on the programs that best match said  
sets associated with a highest value as the ordered value and comprising the greatest  
number of said characteristics.

15. A recommendation system according to claim 9, wherein  
said program recommendations are based on the programs that best match said  
sets associated with a lowest value as the ordered value and comprising the greatest  
number of said characteristics.

16. A recommendation system according to claim 9, wherein  
said sets of said characteristics is formed in response to that at least two of  
programs viewed by said user have the same characteristics.

17. A computer program product, having a computer readable medium,  
having a computer program recorded therein, for enabling a selection of a program for  
viewing in a television system in which title information and characteristics of programs  
are made available as EPG (Electronic Program Guide) data including at least one  
program guide list, the computer program product comprising:

computer program code for recording a plurality of characteristics associated  
with each program viewed by said user in the television system;

computer program code for forming sets of said characteristics, each said set  
comprising at least two of said characteristics; and

computer program code for associating at least each set with an ordered value  
representative of user's desire to view a particular program;

wherein upon entry of a user request for a program recommendation, computer program code for performing a search of the EPG data for programs with characteristics that best match said sets and notifying said user of an availability of programs that best match said sets as program recommendations.

5 18. A computer program product according to claim 17, wherein said search is performed for programs that best match said sets and the user's information determined in accordance with user's manual operations.

10 19. A computer program product according to claim 18, wherein said user's information is including a mood being experienced by said user.

15 20. A computer program product according to claim 17, wherein said program recommendations are based on the programs that best match said sets comprising a greatest number of said characteristics.

20 21. A computer program product according to claim 17, wherein said program recommendations are based on the programs that best match said sets associated with a lowest value as the ordered value.

25 22. A computer program product according to claim 17, wherein said program recommendations are based on the programs that best match said sets associated with a highest value as the ordered value and comprising the greatest number of said characteristics.

30 23. A computer program product according to claim 17, wherein said program recommendations are based on the programs that best match said sets associated with a lowest value as the ordered value and comprising the greatest number of said characteristics.

24. A computer program product according to claim 17, wherein said sets of said characteristics is formed in response to that at least two of programs viewed by said user have the same characteristics.

25. A method of making recommendations to a user of programs for viewing in a television system wherein;

information regarding programs is made available as EPG (Electronic Program Guide) data including at least one program guide list;

5 a plurality of characteristics associated with each program previously viewed by said user, and each of a plurality of relationships and corresponding measures of acceptance of said user, with respect to program recommendations made in response to previous program requests, have been recorded;

said method comprising the steps of:

10 forming sets of said characteristics;

selecting from said relationships at least one relationship, wherein at least one of said selected relationships comprises a highest one of said measures of acceptance;

ordering said sets of characteristics using said selected relationship to produce ordered sets of characteristics;

15 filtering said ordered sets of characteristics using said selected relationship to produce filtered sets of characteristics;

performing a search of the EPG data for programs with characteristics that best match said filtered sets of characteristics, giving preference to highest filtered sets of characteristics; and

20 notifying said user of an availability of programs that best match said filtered sets as program recommendations upon entry of a user request for program recommendations.

26. A method as claimed in claim 25, wherein each said set comprising a plurality of said characteristics.

27. A method as claimed in claim 25, comprising the further step of updating said measure of acceptance.

30 28. A method as claimed in claim 27, wherein each of said relationships comprises a combination of at least a first type relationship and a second type relationship, said measure of said first type relationship being updated as a result of user selections made over an extended period of time and said measure of said second type

relationship being updated as a result of user selections made over a shorter period of time.

29. A method as claimed in claim 28, wherein each of said relationships comprises a combination of said first type relationship having a maximum measure of acceptance and all second type relationships.

30. A method as claimed claim 25, wherein said relationships are user specific.

31. A method as claimed claim 25, wherein each of said sets of characteristics has associated therewith a frequency of occurrence of each said set in programs previously viewed by said user.

32. A method as claimed claim 25, wherein each of said sets of characteristics has associated therewith a date, said date being indicative of when each said set occurred in programs previously viewed by said user.

33. A method as claimed in claim 25 or 26, wherein each of said relationships are defined by a filtering and an ordering command.

34. A method as claimed in claim 33, wherein said filtering command is selected from the list including TimeSlot Filter, WeightFactor Filter, Popularity Filter, Urgency Filter and LifeStyle Filter as herein defined.

35. A method as claimed in claim 34, wherein:  
said TimeSlot Filter depends on a day or time being suitable that for which recommendations are requested, said day or time being comprised in said sets of characteristics and indicative of when each said set occurred in programs previously viewed by said user;

said WeightFactor Filter depends on a frequency of occurrence of each said set in programs previously viewed by said user,

said Popularity Filter depends on a popularity value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to a popular event/program.

said Urgency Filter depends on an urgency value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to an urgent program; and

said LifeStyle Filter depends on a lifestyle value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to a type of a lifestyle.

36. A method as claimed in claim 33, wherein said ordering command is selected from the list including WeightFactor Ordering, Recency Ordering, WeightRecency Ordering as herein defined.

37. A method as claimed in claim 36, wherein:

said WeightFactor Ordering arranges said sets of characteristics by descending a frequency of occurrence of each said set in programs previously viewed by said user;

said Recency Ordering arranges said sets of characteristics by descending a date being comprised in said sets of characteristics and indicative of when each said set occurred in programs previously viewed by said user; and

said WeightRecency Ordering arranges said sets of characteristics by descending said frequency of occurrence, while preferring set of characteristics having most recent date when said frequency are the same.

38. A method as claimed in claim 26, wherein each of said relationships are defined by filtering and an ordering command, said ordering command being selected from the list including WeightFactor Ordering, Specificity Ordering, Generality Ordering, Recency Ordering, WeightRecency Ordering, Specificity Weight Ordering, Generality Weight Ordering, Recency Specificity Ordering, Specificity Recency Ordering and Generality Recency Ordering as herein defined.

39. A method as claimed in claim 38, wherein:

said WeightFactor Ordering arranges said sets of characteristics by descending a frequency of occurrence of each said set in programs previously viewed by said user;

said Specificity Ordering arranges said sets of characteristics by descending a specificity level corresponding to the number of said characteristics being comprised in said set;

5       said Generality Ordering arranges said sets of characteristics by ascending a specificity level;

      said Recency Ordering arranges said sets of characteristics by descending a date being comprised in said sets of characteristics and indicative of when each said set occurred in programs previously viewed by said user;

10       said WeightRecency Ordering arranges said sets of characteristics by descending said frequency of occurrence, while giving preference to set of characteristics having most recent data when said frequency are the same;

      said Specificity Weight Ordering arranges said sets of characteristics by descending said specificity level, while giving preference to set of characteristics having higher frequency of occurrence when said specificity level are the same;

15       said Recency Specificity Ordering arranges said sets of characteristics by descending said date, while giving preference to set of characteristics having higher specificity level when said date are the same;

20       said Specificity Recency Ordering arranges said sets of characteristics by descending said specificity level, while giving preference to set of characteristics having most recent date when said specificity level are the same; and

      said Generality Recency Ordering arranges said sets of characteristics by ascending said specificity level, while giving preference to set of characteristics having most recent date when said specificity level are the same.

25       40.       A recommendation system for making recommendations to a user of programs for viewing in a television system in which information regarding programs is made available as EPG (Electronic Program Guide) data including at least one program guide list, the system comprising:

30       a first memory means for recording a plurality of characteristics associated with each program previously viewed by said user;

      a second memory means for recording each of a plurality of relationships and corresponding measures of acceptance of said user, with respect to program recommendations made in response to previous program requests;

      processing means for forming sets of said characteristics;



task selection means for selecting from said relationships at least one relationship, wherein at least one of said selected relationships comprises a highest one of said measures of acceptance;

ordering means for ordering said sets of characteristics using said selected relationship to produce ordered sets of characteristics;

filtering means for filtering said ordered sets of characteristics using said selected relationship to produce filtered sets of characteristics;

searching means performing a search of the EPG data for programs with characteristics that best match said filtered sets of characteristics, giving preference to highest filtered sets of characteristics; and

on-screen display means for notifying said user of an availability of programs that best match said filtered sets as program recommendations upon entry of a user request for program recommendations.

41. A recommendation system as claimed in claim 40, wherein each said set comprising a plurality of said characteristics.

42. A recommendation system as claimed in claim 40, further comprising a update means for updating said measures of acceptance.

43. A recommendation system as claimed in claim 42, wherein each of said relationships comprises a combination of at least a first type relationship and a second type relationship, said measure of said first type relationship being updated as a result of user selections made over an extended period of time and said measure of said second type relationship being updated as a result of user selections made over a shorter period of time.

44. A recommendation system as claimed in claim 43, wherein each of said relationships comprises a combination of said first type relationship having a maximum measure of acceptance and all second type relationships.

45. A recommendation system as claimed in claim 40, wherein said relationships are user specific.

46. A recommendation system as claimed in claim 40, wherein each of said sets of characteristics has associated therewith a frequency of occurrence of each said set in programs previously viewed by said user.

5 47. A recommendation system as claimed in claim 40, wherein each of said sets of characteristics has associated therewith a date, said date being indicative of when each said set occurred in programs previously viewed by said user.

10 48. A recommendation system as claimed in claim 40 or 41, wherein each of said relationships are defined by a filtering and a ordering command.

49. A recommendation system as claimed in claim 48, wherein said filtering command is selected from the list including TimeSlot Filter, WeightFactor Filter, Popularity Filter, Urgency Filter and LifeStyle Filter, as herein defined

15 50. A recommendation system as claimed in claim 49, wherein:  
said TimeSlot Filter depends on a day or time being suitable that for which recommendations are requested, said day or time being comprised in said sets of characteristics and indicative of when each said set occurred in programs previously viewed by said user;

20 said WeightFactor Filter depends on a frequency of occurrence of each said set in programs previously viewed by said user,

25 said Popularity Filter depends on a popularity value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to a popular event/program.

said Urgency Filter depends on an urgency value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to an urgent program; and

30 said LifeStyle Filter depends on a lifestyle value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to a type of a lifestyle.

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51. A recommendation system as claimed in claim 48, wherein said ordering command is selected from the list including WeightFactor Ordering, Recency Ordering, WeightRecency Ordering as herein defined.

5 52. A recommendation system as claimed in claim 51, wherein:  
said WeightFactor Ordering arranges said sets of characteristics by descending a frequency of occurrence of each said set in programs previously viewed by said user;  
said Recency Ordering arranges said sets of characteristics by descending a date being comprised in said sets of characteristics and indicative of when each said set  
10 occurred in programs previously viewed by said user; and  
said WeightRecency Ordering arranges said sets of characteristics by descending said frequency of occurrence, while preferring set of characteristics having most recent date when said frequency are the same.

15 53. A method as claimed in claim 41, wherein each of said relationships are defined by filtering and an ordering command, said ordering command being selected from the list including WeightFactor Ordering, Specificity Ordering, Generality Ordering, Recency Ordering, WeightRecency Ordering, Specificity Weight Ordering, Generality Weight Ordering, Recency Specificity Ordering, Specificity Recency Ordering and  
20 Generality Recency Ordering as herein defined.

54. A recommendation system as claimed in claim 53, wherein:  
said WeightFactor Ordering arranges said sets of characteristics by descending a frequency of occurrence of each said set in programs previously viewed by said user;  
25 said Specificity Ordering arranges said sets of characteristics by descending a specificity level corresponding to the number of said characteristics being comprised in said set;  
said Generality Ordering arranges said sets of characteristics by ascending a specificity level;  
30 said Recency Ordering arranges said sets of characteristics by descending a date being comprised in said sets of characteristics and indicative of when each said set occurred in programs previously viewed by said user;

said Weight Recency Ordering arranges said sets of characteristics by descending said frequency of occurrence, while giving preference to set of characteristics having most recent data when said frequency are the same;

5 said Specificity Weight Ordering arranges said sets of characteristics by descending said specificity level, while giving preference to set of characteristics having higher frequency of occurrence when said specificity level are the same;

said Recency Specificity Ordering arranges said sets of characteristics by descending said date, while giving preference to set of characteristics having higher specificity level when said date are the same;

10 said Specificity Recency Ordering arranges said sets of characteristics by descending said specificity level, while giving preference to set of characteristics having most recent date when said specificity level are the same; and

15 said Generality Recency Ordering arranges said sets of characteristics by ascending said specificity level, while giving preference to set of characteristics having most recent date when said specificity level are the same.

55. A computer program product, having a computer readable medium, having a computer program recorded therein, for making recommendations to a user of programs for viewing in a television system wherein:

20 information regarding programs is made available as EPG (Electronic Program Guide) data including at least one program guide list;

a plurality of characteristics associated with each program previously viewed by said user, and each of a plurality of relationships and corresponding measures of acceptance of said user, with respect to program recommendations made in response to  
25 previous program requests, have been recorded;

said computer program product comprising:

code for forming sets of said characteristics;

30 code for selecting from said relationships at least one relationship, wherein at least one of said selected relationships comprises a highest one of said measures of acceptance;

code for ordering said sets of characteristics using said selected relationship to produce ordered sets of characteristics;

code for filtering said ordered sets of characteristics using said selected relationship to produce filtered sets of characteristics;

code for performing a search of the EPG data for programs with characteristics that best match said filtered sets of characteristics, giving preference to highest filtered sets of characteristics; and

code for notifying said user of an availability of programs that best match said filtered sets as program recommendations upon entry of a user request for program recommendations.

56. A computer program product as claimed in claim 55, wherein each said set comprising a plurality of said characteristics.

57. A computer program product as claimed in claim 55, further comprising code for updating said measure of acceptance.

58. A computer program product as claimed in claim 57, wherein each of said relationships comprises a combination of at least a first type relationship and a second type relationship, said measure of said first type relationship being updated as a result of user selections made over an extended period of time and said measure of said second type relationship being updated as a result of user selections made over a shorter period of time.

59. A computer program product as claimed in claim 58, wherein each of said relationships comprises a combination of said first type relationship having a maximum measure of acceptance and all second type relationships.

60. A computer program product as claimed in claim 55, wherein said relationships are user specific.

61. A computer program product as claimed in claim 55, wherein each of said sets of characteristics has associated therewith a frequency of occurrence of each said set in programs previously viewed by said user.

62. A computer program product as claimed in claim 55, wherein each of said sets of characteristics has associated therewith a date, said date being indicative of when each said set occurred in programs previously viewed by said user.

63. A computer program product as claimed in any one of claims 55 or 56, wherein each of said relationships are defined by a filtering and a ordering command.

5 64. A computer program product as claimed in claim 63, wherein said filtering command is selected from the list including TimeSlot Filter, WeightFactor Filter, Popularity Filter, Urgency Filter and LifeStyle Filter as herein defined.

10 65. A computer program product as claimed in claim 64, wherein:  
said TimeSlot Filter depends on a day or time being suitable that for which recommendations are requested, said day or time being comprised in said sets of characteristics and indicative of when each said set occurred in programs previously viewed by said user;

15 said WeightFactor Filter depends on a frequency of occurrence of each said set in programs previously viewed by said user,

said Popularity Filter depends on a popularity value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to a popular event/program.

20 said Urgency Filter depends on an urgency value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to an urgent program; and

25 said LifeStyle Filter depends on a lifestyle value being comprised in said sets of characteristics and indicative that each program previously viewed by said user corresponds to a type of a lifestyle.

66. A computer program product as claimed in claim 63, wherein said ordering command is selected from the list including WeightFactor Ordering, Recency Ordering, WeightRecency Ordering as herein defined.

30 67. A computer program product as claimed in claim 66, wherein:  
said WeightFactor Ordering arranges said sets of characteristics by descending a frequency of occurrence of each said set in programs previously viewed by said user;

said Recency Ordering arranges said sets of characteristics by descending a date being comprised in said sets of characteristics and indicative of when each said set occurred in programs previously viewed by said user; and

said WeightRecency Ordering arranges said sets of characteristics by descending  
5 said frequency of occurrence, while preferring set of characteristics having most recent date when said frequency are the same.

68. A computer program product as claimed in claim 66, wherein each of  
said relationships are defined by filtering and an ordering command, said ordering  
10 command being selected from the list including WeightFactor Ordering, Specificity Ordering, Generality Ordering, Recency Ordering, WeightRecency Ordering, Specificity Weight Ordering, Generality Weight Ordering, Recency Specificity Ordering, Specificity Recency Ordering and Generality Recency Ordering as herein defined.

15 69. A computer program product as claimed in claim 68, wherein:  
said WeightFactor Ordering arranges said sets of characteristics by descending a frequency of occurrence of each said set in programs previously viewed by said user;

said Specificity Ordering arranges said sets of characteristics by descending a  
specificity level corresponding to the number of said characteristics being comprised in  
20 said set;

said Generality Ordering arranges said sets of characteristics by ascending a specificity level;

said Recency Ordering arranges said sets of characteristics by descending a date being comprised in said sets of characteristics and indicative of when each said set  
25 occurred in programs previously viewed by said user;

said WeightRecency Ordering arranges said sets of characteristics by descending said frequency of occurrence, while giving preference to set of characteristics having most recent data when said frequency are the same;

said Specificity Weight Ordering arranges said sets of characteristics by  
30 descending said specificity level, while giving preference to set of characteristics having higher frequency of occurrence when said specificity level are the same;

said Recency Specificity Ordering arranges said sets of characteristics by descending said date, while giving preference to set of characteristics having higher specificity level when said date are the same;

said Specificity Recency Ordering arranges said sets of characteristics by descending said specificity level, while giving preference to set of characteristics having most recent date when said specificity level are the same; and

said Generality Recency Ordering arranges said sets of characteristics by ascending said specificity level, while giving preference to set of characteristics having most recent date when said specificity level are the same.

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